# STATE OF CALIFORNIA BUSINESS, TRANSPORTATION AND HOUSING DEPARTMENT OF TRANSPORTATION

## TRAFFIC MANUAL

# CHAPTER 10 SCHOOL AREA PEDESTRIAN SAFETY

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#### INTRODUCTION

Traffic accidents involving pedestrians are of serious concern to Traffic Engineers. This traffic issue arouses significant emotion and public indignation when the pedestrians are school-age children. Parents and civic leaders are persistent in their demands for more signs, markings and signals in and around school areas and other locations which attract children.

Accident statistics indicate that children are more often involved in non-school related accidents. This may be indicative that the standard treatments prescribed for traffic control around school facilities are effective. Following uniform standards and safety provisions is a contributing factor to reducing the risk of pedestrian accidents.

The standards and the guidelines presented herein relate to school pedestrians, in grades Kindergarten through 12th. They are presented separately from the general application and design of traffic control devices because of the special nature of the school pedestrian.

This is Chapter 10 of the Department of Transportation (Caltrans) Traffic Manual. It is also published separately for easy reference.

This Manual may be purchased from the State of California, Department of Transportation, 1900 Royal Oaks Drive, Sacramento, California 95815.

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#### **GENERAL PROVISIONS**

#### **Need for Uniformity**

As with other forms of traffic control, uniformity in application and operation of traffic control devices around school facilities promotes the orderly and predictable movement of traffic. It is important that motorists understand their responsibilities as they are older and more experienced in traffic situations than young school pedestrians.

Traffic controls in school areas must be uniformly applied on the basis of established guidelines combined with sound engineering studies. There are instances where school area controls were installed when they were not needed. These controls are not only unnecessary, but costly to maintain. More importantly, the lack of respect accorded the unnecessary control lessens the respect for traffic control devices in general.

From an engineering standpoint, the issue of traffic control and operation in school areas is one of evaluating approved devices while taking into consideration child-pedestrian behavior and driver reaction. The Federal Highway Administration publication "Traffic Control Devices Handbook" contains information on child-pedestrian behavior and driver reaction based on various national research projects.

#### **Educational Measures**

Parents, school administrators, traffic officials, civic leaders, and vehicle drivers share the responsibility of educating school pedestrians on the use of traffic control devices. Programs in the home and school to train the child as a responsible pedestrian are an important factor in improving their understanding of traffic control devices.

The following sections address the current practices in applying uniform measures for school age pedestrians. Such measures include safe walking routes, signs, markings, signals, pedestrian separation structures, adult crossing guards and school safety patrols.

#### **Legal Authority**

California Vehicle Code (CVC) references are used throughout this chapter when the subject matter relates to the law.

CVC 21372 Guidelines for Traffic Control Devices Near Schools. The Department of Transportation and local authorities shall, with respect to highways under their respective jurisdictions, establish and promulgate warrants to be used as guidelines for the placement of traffic control devices near schools for the purpose of protecting students going to and fromschool. Such devices may include flashing signals. Such warrants shall be based upon, but need not be limited to, the following items: pedestrian volumes, vehicle volumes, width of the roadway, physical terrain, speed of vehicle traffic, horizontal and vertical alignment of the roadway, the distance to existing traffic control devices, proximity to the school, and the degree of urban or rural environment of the area.

CVC 21373 School Board Request for Traffic Control Devices. The governing board of any school district may request the appropriate city, county, city and county or state agency to install traffic control devices in accordance with the warrants established pursuant to Section 21372. Within 90 days thereafter, the city, county, city and county or state agency involved shall undertake an engineering and traffic survey to determine whether the requested crossing protection meets the warrarns established pursuant to Section 21372. The city, county, city and county, or state agency involved may require the requesting school district to pay an amount not to exceed 50 percent of the cost of the survey. If it is determined that such reqested protection is warranted, it shall be installed by the city, county, city and county or state agency involved.

Speed limits in the vicinity of schools are established by Sections 22350 (Basic Speed Law), 22352(b) and 22358.4 of the California Vehicle Code.

CVC 22350 Basic Speed Law. No person shall drive a vehicle upon a highway at a speed greater than is reasonable or prudent having due regard for weather, visibility, the traffic on, and the surface and width of, the highway, and in no event at a speed which endangers the safety of persons or property.

CVC 22352 Prima Facie Speed Limits. (b)Twenty-five miles per hour: (2) When passing a school building or the grounds thereof, contiguous to a highway and posted with a standard "SCHOOL" warning sign, while children are going to or leaving the school either during school hours or during the noon recess period. The prima facie limit shall also apply when passing any school grounds which are not separated from the highway by a fence, gate or other physical barrier while the grounds are in use by children and the highway is posted with a standard "SCHOOL" warning sign.

CVC 22358.4 Decrease of Local Limits Near Schools or Senior Centers. Whenever a local authority determines upon the basis of an engineering and traffic survey that the prima facie speed limit of 25 miles per hour established by paragraph (2) or (3) of subdivision (b) of Section 22352 is more than is reasonable or safe, the local authority may, by ordinance or resolution, determine and declare a prima facie speed limit of 20 or 15 miles per hour, whichever is justified as the appropriate speed limit by such survey. The ordinance or resolution shall not be effective until appropriate signs giving notice of the speed limit are erected upon the highway and, in the case of a state highway, until the ordinance is approved by the Department of Transportation and the appropriate signs are erected upon the highway.

Other CVC sections are annotated throughout the text where applicable.

#### **Definitions**

#### As used in this chapter:

- 1. "ADEQUATE CROSSING GAP" see page 10-18.
- 2. "CVC" the California Vehicle Code.
- 3. "CAC" the California Administrative Code.
- 4. "ELEMENTARY SCHOOL" usually the first six or the first eight grades (including kindergarten), or as may be defined by a local School District, Board, or Agency.
- 5. "RURAL AREAS" those areas inhabited by fewer than 10,000 residents.
- 6. "SCHOOL CROSSWALKS" and "SCHOOL CROSSINGS" all marked crosswalks along the "Suggested Route to School" (See Section 10-02.3-1).
- 7. "SCHOOL ZONE" all streets and highways contiguous to the school grounds (public or private) when "SCHOOL" warning signs (W65) are in place.
- 8. "SCHOOL PEDESTRIANS", "CHILDREN", and "STUDENTS" used interchangeably and may include student bicyclists for the purpose of determining appropriate crossing protection measures.
- "SHALL" A mandatory condition. Where certain requirements in the design or application of the device are described with the "shall" stipulation, it is mandatory when an installation is made that these requirements be met.
- 10. "SHOULD" An advisory condition. Where the word "should" is used it is considered to be advisable usage, recommended but not mandatory.
- 11. "MAY" A permissive condition. No requirements for design or application are intended.

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#### CHAPTER 10 SCHOOL AREA PEDESTRIAN SAFETY

#### General 10-01

#### 10-01.1 Need for Uniformity

Traffic control in school areas is a highly sensitive subject. If all the requests were met, there would have to be many more police and adult school crossing guards; and many more traffic signals, signs, and markings. Such requests, however, are not always in line with sound traffic engineering.

Traffic engineering analysis often reveals that at many locations, requested school crossing controls are unnecessary, costly, and tend to lessen the respect for those controls that are needed. It is important to stress the point that effective traffic control can best be obtained through the uniform application of realistic policies, practices and guidelines developed through properly conducted engineering studies.

#### 10-01.2 Application of Guidelines

The guidelines of this chapter apply to all streets and highways open to public travel regardless of type or the level of governmental agency having jurisdiction (see CVC 21372).

All traffic control devices used in school areas shall conform to the specifications of this chapter

and other applicable sections of the State Traffic Manual unless an engineering study, properly documented and approved, concludes there is a more appropriate solution. It is the intent that the provisions of this chapter define the use of traffic control devices, but shall not be a legal requirement for their installation.

#### 10-01.3 Engineering and Traffic Survey Required

The decision to use a particular device at a particular location shall be made on the basis of an engineering and traffic survey (see CVC 21373). Thus, while this chapter provides guidelines for the design and application of traffic control devices in school areas, it cannot be a substitute for engineering judgement.

#### 10-01.4 Maintenance of Traffic Control Devices

Maintenance of traffic control devices shall ensure legibility, visibility, functionality, and that the device is removed if no longer needed. Devices which are used on a part-time basis should be in operation only during the time periods they are required.

#### School Routes and Established School Crossings 10-02

#### 10-02.1 Policy

There is a need in each school district to establish an organization concerned with students enroute to and from school. Through such an organization, the school district can be responsibly involved in processing requests for traffic safety controls and for safety programs and can coordinate activities within and between the community and public agencies.

In order to provide a responsible administrative structure for the school area, each school district is encouraged to (1) assign student pedestrian responsibilities to a competent staff member and/or (2) organize a school student pedestrian advisory committee to serve the needs of each public and private school.

When the advisory committee structure is used, the committee should include governmental and school district staff who have the responsibility and authority to initiate and provide programs and projects.

Representatives from the city and/or county superintendent of schools office should be the official members. Advisors should include representatives of the local area Safety Council, traffic engineers, police authorities, the Parent-Teachers Association, Automobile Clubs (AAA), plus others as needed.

#### 10-02.2 Staff and Committee Responsibility

The duties of staff members and/or each committee should be to guide and coordinate all activities connected with the school traffic safety program, such as:

1. Establish traffic safety policies and procedures.

- 2. Recommend priorities for proposed improvement projects.
- 3. Notify the responsible agencies of school-pedestrian-traffic related issues.
- 4. Review and approve the various phases of the school student traffic safety program.
- 5. Review and process requests and complaints.
- 6. Promote good public relations.

The County Superintendent of School's office should coordinate all student pedestrian committees' actions in establishing and promoting uniform practices for school pedestrian safety throughout the county.

#### 10-02.3 School Responsibility

Traffic related issues about school pedestrians on the approaches to the school shall be referred to the local principal for review and transmission to the appropriate staff person or to the school student pedestrian advisory committee. The school district governing board may request the appropriate city, county, or state agency to consider the installation of traffic control devices. The agency involved shall undertake an engineering and traffic survey to determine whether the request is justified. The school district may be required to pay an amount up to 50 percent of the cost of the survey (see CVC 21373).

The principal or designated staff person of every school serving kindergarten and elementary students should:

1. Develop, cooperatively with local officials, a "Suggested Route to School" plan showing all streets, school location, and the routes to be used by students enroute to and from school.

School routes should be planned to take advantage of existing traffic control devices. This may make it necessary for children to walk an indirect, longer distance to a location where there are existing traffic control devices.

Factors to be considered when determining the feasibility of requiring children to walk a longer distance to a crossing (at a location with an existing traffic control device) are:

- a. The availability of adequate sidewalks or off-roadway sidewalk areas to and from the location with existing control,
- b. The number of children using the crossing,
- c. The age levels of the children using the crossing, and
- d. The total extra walking distance.

Guidelines for school routes are contained in a "A Teacher's Guide to the Safest Route to School Project" booklet.\* A typical school route plan is shown in Figure 10-2.

- 2. Instruct the students on the use and purpose of the "Suggested Route to School" plan.
- 3. Make field reviews of the plan to ensure

that the "Suggested Route to School" is being used. Special attention should be given to the activities of the students. Recommendations for alteration or addition of parking, bus loading, traffic control devices, and removal of obstructions along the route should be referred to the responsible government agency.

4. Review the "Suggested Route to School" plan annually for any necessary revisions or additions.

## 10-02.4 Governmental Traffic Agency Responsibility

Upon request of the local school district, responsible traffic authorities shall investigate all locations along the "Suggested Route to School" and recommend appropriate traffic control measures. Inherent in this analytical process are two fundamental assumptions developed from successful past experience:

- 1. The maximum delay to students at an uncontrolled crossing should be no greater than would be experienced if a traffic control signal were in operation at the location.
- 2. An adequate crossing gap (the time required for a student to cross the street) in approaching traffic should occur randomly at an average rate of 60 gaps per hour during the school crossing period.

See Traffic Manual Section 6-02.12, Crosswalks and Crosswalk Lines, for factors which should be considered in determining whether a marked crosswalk should be used.

<sup>\*</sup> Available from the Automobile Club of Southern California and the California State Automobile Association (AAA).

#### 10-02.5 School Crossing Control Criteria

Alternate gaps and blockades are formed in the vehicular traffic stream in a pattern peculiar to each crossing location. To reduce the risk of an accident at a specific crossing, adequate gaps must be available. When adequate gaps are less than an average rate of 60 gaps per hour, some form of traffic control device should be considered that will create adequate gaps in the traffic stream.

Properly conducted engineering and traffic studies will determine the appropriate measures to be developed at school crossings. Types of school pedestrian measures that can be considered can include:

- 1. Warning signs and markings.
- 2. Variable speed limits.
- 3. Intersection stop signs.
- 4. Flashing yellow beacons.

- 5. Traffic signals.
- 6. Remove visibility obstructions.
- 7. School Safety Patrol.
- 8. Adult Crossing Guard.
- 9. Pedestrian separation structures.
- 10. Pedestrian walkways along the roadway.
- 11. Pedestrian walkways separated from the roadway.
- 12. Parking controls and curb-use zones.
- 13. Bus transportation.

Some criteria to be used as guidelines for the application of school pedestrian measures are discussed throughout this chapter.

#### **Signs 10-03**

#### 10-03.1 Design of Signs

Uniformity in design includes shape, color, dimensions, symbols, wording, lettering, and illumination or retroreflectorization.

Only permanent-type uniform traffic signs approved by the Department of Transportation (Caltrans) shall be used on public highways, and shall conform to State "Traffic Sign Specifications" (published by Caltrans) for size, character dimensions and letter stroke width (see CVC 21400).

All shapes and colors shall be as indicated on the sign specification sheet, all symbols shall be as shown and, where a word message is applicable, the wording shall be as provided herein.

A change from word message to symbol requires a significant time period for public education and transition. For this purpose, educational plaques are provided for use beneath new symbol signs.

Approved symbol signs may be erected without educational plaques. New warning or regulatory symbol signs shall be accompanied by an educational plaque which is to remain in place for at least three years after initial installation. No special effort need be made to remove educational plaques as long as they are in serviceable condition.

Illustrations which accompany the text show the specifications for individual sign size, color, and legend. (see Section 10-03.8 "Policy for School Area Signs").

#### 10-03.2 Dimensions of Signs

The standard sign dimensions prescribed in the "Traffic Sign Specifications" shall be the minimum for use on public highways. An increase above the standard sizes is permitted for greater legibility or emphasis.

# 10-03.3 Illumination and Retroreflectorization of Signs

Signs used for school area traffic control shall be retroreflective or illuminated when regularly scheduled classes begin or end during hours of darkness, and should be retroreflective or illuminated when there may be use of school buildings during hours of darkness.

#### 10-03.4 Position of Signs

Signs shall be placed in positions where they will convey their messages most effectively without restricting lateral clearance or sight distances. Placement therefore should be accommodated to highway design, alignment, and roadside development.

Signs should have adequate lateral clearance from the edge of the traveled way to reduce the risk of an accident by an errant vehicle. In rural locations, signs should be 1.8 m from the edge of a paved shoulder, or if there is no shoulder, 3.6 m from the edge of the traveled way.

In urban locations, if the lateral clearances in the preceding paragraph are not attainable, a lesser clearance may be used (not less than 0.6 m from the face of a curb). Where sidewalk widths are limited or existing poles are close to the curb, a clearance of 0.3 m from the curb face is permissible (see Figure 10-1).

Portable school signs (except hand-held units for adult crossing guards, school safety patrols, and school bus drivers) shall not be placed within the roadway at any time.

Typical school area signing is illustrated in Figures 10-3 through 10-6.

#### 10-03.5 Height of Signs

Signs erected in rural areas shall be mounted at a height of at least 1.5 m, measured from the bottom of the sign to the edge of roadway or top of curb, as appropriate. In business, commercial and residential districts where parking or pedestrian movement is likely to occur or where there are other obstructions to view, the clearance to the bottom of the sign shall be at least 2.1 m (see Figure 10-1).

#### 10-03.6 Erection of Signs

Signs shall be mounted approximately at right angles to the direction of, and facing, the traffic that they are intended to serve.

Where mirror reflection from the sign face is encountered in such degree as to reduce legibility, the sign shall be turned slightly away from the road. When signs are offset 9 m or more from the pavement edge, signs should generally be turned toward the road. At curved alignments, the angle of placement shall be determined by the course of approaching traffic rather than by the roadway edge at the point where the sign is located. Sign faces normally are vertical, but on grades it may be desirable to tilt a sign forward or back from the vertical to improve the viewing angle.

#### 10-03.7 Parking and Stopping Signs

Parking signs and other signs governing the stopping and standing of vehicles in school areas are controlled by a wide variety of regulations and only general specifications can be discussed here.

The following types of signs may be applicable:

1. Time Limit Parking of two hours or less on school days.

- Parking prohibition during specified times or days along school frontage or school approaches for adequate visibility of walkways, gates, entrances, crossings and unfenced grounds; or for adequate passenger, bus and commercial loading; or for unrestricted walkway access on a school approach.
  - a. "No Stopping", "No Parking" or "No Stopping - Buses Excepted" during specified times or days.
  - b. Temporary parking prohibitions or restrictions for special events to minimize congestion and delay during periods of extra heavy traffic demand.

The legend on parking signs shall state whatever regulations apply, and the signs shall conform to the standards of shape, color, position and use. Generally, parking signs should display such of the following information as is appropriate, from top to bottom of the sign, in the order listed:

- 1. Restriction or prohibition.
- 2. Time of day it is applicable, if not at all hours.
- 3. Days of week applicable, if not every day.

In addition, there should be a single-headed arrow pointing in the direction the regulation is in effect (if the sign is at the end of a zone) or a double-headed arrow pointing both ways (if the sign is at an intermediate point in the zone). As an alternate to the arrow (if the signs are posted facing traffic at an angle of 90 degrees to the curb line), there may be included on the sign, or on a separate

plate below the sign, such legends as BEGIN, END, HERE TO CORNER, HERE TO ALLEY, THIS SIDE OF SIGN, or BETWEEN SIGNS.

Where parking is prohibited at all times or at specified times, parking signs shall have red letters and border on a white background (Parking Prohibition signs). Where only limited-time parking is permitted, or where parking is permitted only in a particular manner, the signs shall have green letters and border on a white background (Parking Restriction signs).

For emphasis, the word NO or the numeral showing the time limit in hours or minutes may be in a reversed color arrangement in the upper left hand corner of the sign, i.e., in white on a rectangular areas of red or green.

The No Parking symbol (R26D) may be used as an alternative to the words NO PARKING on signs.

If arrows and/or word legends on a separate panel are used to indicate the extent of the restricted zone, the signs should be set at an angle of not less than 30 degrees nor more than 45 degrees with the line of traffic flow to be visible to approaching traffic.

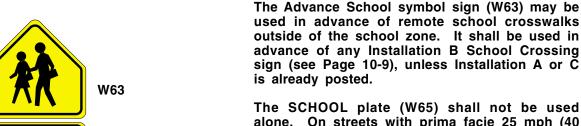
Street closures are authorized by local ordinance or resolution on streets crossing or dividing school grounds when necessary for the protection of persons attending the school (see CVC 21102).

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#### 10-03.8 Policy for School Area Signs

STANDARD School Zone Signing defines the beginning of the school zone on all streets contiguous to schools serving students in Kindergarten through 12th grades. School zone signing should be posted at the school boundary, but may be posted up to 150 m in advance, depending on prevailing approach speeds and visibility. However, school zone signing is not required if there are no school pedestrians using the highway and the school grounds are separated from the highway by a fence, gate or other physical barrier (CVC 22352).

#### **POLICY**



alone. On streets with prima facie 25 mph (40 km/h) speed limits that are contiguous to a school building or school grounds, the W65 is combined with the W63 to form Installation A, used to inform drivers that they are entering a school zone.



Installation A



**Installation C** 

On streets with speed limits above 25 mph (40 km/h), the W65 is combined with the R2(25) and R72 to form Installation C, used to inform drivers they are entering a school zone with a 25 mph (40 km/h) speed limit at certain times. Installation C may be used in lieu of Installation A.

Note: Installations A or C sign assemblies may be fabricated as a single unit (SW24 and SR4 respectively).

#### **School Area Signs - Continued**

#### **POLICY**



W65-1

The end of an authorized and posted school speed zone shall be marked with a standard Speed Limit sign (R2) showing the speed limit for the section of highway which follows or with an END SCHOOL ZONE sign (W65-1).



**Installation B** 

The School Crossing sign (W66) is combined with the SCHOOL XING plate (W66A) to form an Installation B, which may be used at school crosswalks on the "Suggested Route to School". It shall not be used where the crossing is controlled by a Stop sign or traffic signal or a Yield sign is placed on one or more of the crossing approaches.

The W66 and W66A signs should be posted at the crosswalk but may be posted up to 15 m in advance.

The Advance School symbol sign (W63) shall be used in advance of any Installation B, unless Installation A or C is already posted.

Note: Installation B sign assembly may be frabricated as a single unit (SW25).



Installation D

The SCHOOL BUS STOP \_\_\_\_\_ FT sign (W64) shall be used to give advance notice of approved school bus stops where stopping sight distance is less than 60 m (see CVC 22504). The distance shown on the sign shall be adjusted to fit conditions.

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#### **School Area Signs - Continued**

#### **POLICY**



The STOP-SCHOOL-CROSSING sign (on pole) (SR31) may be used by School Safety Patrols while assisting school pedestrians across the street.



The STOP paddle (C28A) may be used by adult crossing guards or school bus drivers, however, it shall display STOP (C28A) on both sides

#### Markings 10-04

#### 10-04.1 Functions and Limitations of Markings

Markings have definite and important functions to perform in a proper scheme of school area traffic control. In some cases they are used to supplement the regulations or warnings of other devices such as traffic signs. In other cases they serve, soley on their own merits, as a very effective means of conveying certain regulations and information to the driver without diverting the driver's attention from the roadway.

#### 10-04.2 Uniformity

Each standard school area marking shall be used only to convey the meaning prescribed for it in this chapter.

#### 10-04.3 Crosswalk Lines

In accordance with the provisions of CVC 21368:

"Whenever a marked pedestrian crosswalk has been established in a roadway contiguous to a school building or the grounds thereof, it shall be painted or marked in yellow as shall be all the marked pedestrian crosswalks at an intersection in case any one of the crosswalks is required to be marked in yellow. Other established marked pedestrian crosswalks may be painted or marked in yellow if either (a) the nearest point of the crosswalk is not more than 600 feet from a school building or the grounds thereof, or (b) the nearest point of the crosswalk is not more than 2,800 feet from a school building or the grounds thereof, there are no intervening crosswalks other than those contiguous to the school grounds, and it appears that the facts and circumstances require special painting or marking of the crosswalks for

# the protection and safety of persons attending the school..."

Crosswalk lines are solid lines marking both edges of the crosswalk. The crosswalk line shall not be less than 300 mm in width and shall not be spaced less than 1.8 m apart. Where no advance limit line is provided or where vehicular speeds exceed 35 mph (56 km/h) or where crosswalks are unexpected, it may be desirable to increase the width of the crosswalk line up to 600 mm. Crosswalk lines on both sides of the crosswalk should extend across the full width of pavement to discourage diagonal walking between crosswalks.

Crosswalks should be marked at all intersections on the "Suggested Route to School" where students are permitted to cross between intersections, or where students could not otherwise recognize the proper place to cross.

For added emphasis, the area of the crosswalk may be marked with diagonal lines at a 45 degree angle or with longitudinal lines at a 90 degree angle to the line of the crosswalk. These lines should be 300 mm to 600 mm wide and spaced 300 mm to 600 mm apart. When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted.

#### 10-04.4 Limit Lines (Stop Lines)

Limit lines are solid white lines (CVC 377), normally 300 mm to 600 mm wide, extending across all approach lanes. They indicate the point at which vehicles are required to stop in compliance with a stop sign, traffic signal, officer's direction, or other legal requirement. The limit line should be placed 1.2 m in advance of and parallel to the nearest crosswalk line, but may be placed farther in advance where School Safety Patrols or Adult Crossing Guards are used.

#### 10-04.5 Curb Markings for Parking Restrictions

The color of curb markings shall conform to CVC 21458, quoted below:

21458. (a) Whenever local authorities enact local parking regulations and indicate them by the use of paint upon curbs, the following colors only shall be used, and the colors indicate as follows:

- (1) Red indicates no stopping, standing, or parking, whether the vehicle is attended or unattended, except that a bus may stop in a red zone marked or signposted as a bus loading zone.
- (2) Yellow indicates stopping only for the purpose of loading or unloading passengers or freight for the time as may be specified by local ordinance.
- (3) White indicates stopping for either of the following purposes:
  - (A) Loading or unloading of passengers for the time as may be specified by local ordinance.
  - (B) Depositing mail in an adjacent mail box.
- (4) Green indicates time limit parking specified by local ordinance.
- (5) Blue indicates parking limited exclusively to the vehicles of disabled persons and disabled veterans.

(b) Regulations adopted pursuant to subdivision (a) shall be effective on days and during hours or times as prescribed by local ordinances.

Curb markings may supplement standard signs. When signs are not used, intended meaning should be stenciled on the curb.

Signs shall always be used with curb markings in those areas where curb markings are obliterated by accumulations of snow and ice.

#### 10-04.6 Word and Symbol Markings

SLOW SCHOOL XING legends shall be used in accordance with the provisions of CVC 21368 in advance of all yellow school crosswalks. They shall not be used where the crossing is controlled by stop signs, traffic signals, or yield signs. They shall be yellow, with the word XING at least 30 m in advance of the school crosswalk.

SCHOOL XING legends and crosswalks may be used at remote locations outside of the school zone, and shall be white (CVC 21368).

SCHOOL legends may be used with sign Installations A or C, except at locations where SLOW SCHOOL XING legends are required. When used, they shall be yellow, and should be located adjacent to the sign.

Letters, symbols and numerals should be 2.4 m or more in height. If the message consists of more than one word, it should read "up" i.e., the first word should be nearest to the driver.

The space between lines should be at least four times the height of the characters for low speed roads but not more than ten times the height of the characters under any conditions.

Pavement messages should be no more than one lane in width except SCHOOL messages may extend to the width of two lanes. When a two-lane width is used the characters should be 3 m or more in height.

#### Flashing Yellow Beacons 10-05

#### 10-05.1 Function of Flashing Yellow Beacons

Flashing yellow beacons may be installed to supplement standard school signing and markings for the purpose of providing advance warning during specified times of operation when justified (see Figure 10-6).

If school authorities are to operate the flashing yellow beacon, an inter-agency agreement shall be executed to assure designation of a responsible adult to operate the beacon controls and to provide accessibility for necessary equipment maintenance.

#### 10-05.2 Criteria for Flashing Yellow Beacons

A flashing yellow beacon may be justified when ALL of the following conditions are fulfilled:

1. The uncontrolled school crossing is on the "Suggested Route to School"; and

- 2. At least 40 school pedestrians use the crossing during each of any two hours (not necessarily consecutive) of a normal school day; and
- 3. The crossing is at least 180 m from the nearest alternate crossing controlled by traffic signals, stop signs or crossing guards; and
- 4. The vehicular volume through the crossing exceeds 200 vehicles per hour in urban areas or 140 vehicles per hour in rural areas during the same hours the students are going to and from school during normal school hours; and
- 5. The critical approach speed (85 percentile) exceeds 35 mph (56 km/h) or the approach visibility is less than the stopping sight distance.

#### **School Crossing Traffic Signals 10-06**

## 10-06.1 Function of School Crossing Traffic Signals

A traffic signal assigns intersection right-ofway and promotes the orderly movement of pedestrians and vehicles. However, improper signal controls may lead to intentional violations, unnecessary delays and traffic diversion to less desirable alternate routes.

#### 10-06.2 Criteria for School Crossing Traffic Signals

Occasionally it is necessary to install a traffic signal to extend or create crossing gaps in the flow of traffic on the "Suggested Route to School". This is done when no other controlled crossing is located within 180 m. School crossing traffic signals shall be investigated when the warrants noted in Chapter 9 of the State Traffic Manual are met and when either of the following conditions is fulfilled:

- 1. Urban Areas 500 vehicles and 100 school pedestrians for each of any two hours (not necessarily consecutive) daily while students are crossing to or from school; or
  - 500 vehicles for each of any two hours daily while students are crossing to or from school and a total of 500 school pedestrians during the entire day.
- 2. Rural Areas 350 vehicles and 70 school pedestrians for each of any two hours (not necessarily consecutive) daily while students are crossing to or from school; or

350 vehicles for each of any two hours (not necessarily consecutive) daily while students are crossing to or from school and minimum total of 350 school pedestrians during the entire day.

When the critical (85th percentile) approach speed exceeds 35 mph (56 km/h) or the sight distance to the intersection is less than the required stopping sight distance, rural criteria should be applied.

The design of school crossing traffic signals shall conform to Chapter 9 of the State Traffic Manual and include the following considerations:

- 1. The signals shall be designed for full-time operation.
- 2. Pedestrian signal faces of the International Symbol type shall be installed at all marked crosswalks at signalized intersections along the "Suggested Route to School."
- 3. Non-intersection school pedestrian crosswalk locations may be signalized when justified.
- 4. If an intersection is signalized under this guideline for school pedestrians, the entire intersection shall be signalized.
- 5. School area traffic signals shall be traffic actuated type with push buttons or other detectors for pedestrians.

#### **Crossing Supervision 10-07**

#### 10-07.1 Types of Crossing Supervision

There are two types of school crossing supervision:

- Adult control of pedestrians and vehicles with Adult Crossing Guards or police officers.
- 2. Student control of only pedestrians with School Safety Patrol.

Recommended practices for the organization, operation and administration of Adult Crossing Guards and Student Safety Patrols are given in "SCHOOL CROSSING GUARD PROGRAMS" and "SCHOOL SAFETY PATROL PROGRAM" booklets.\* Also, see below.

#### 10-07.2 Adult Crossing Guards

Adult Crossing Guards may be assigned at designated school crossings to assist elementary school pedestrians at specified hours when going to or from school. The following suggested policy for their assignment applies only to crossings serving elementary school pedestrians on the "Suggested Route to School".

An Adult Crossing Guard should be considered when:

- Special situations make it necessary to assist elementary school pedestrians in crossing the street.
- 2. A change in the school crossing location is being made, but prevailing conditions require school crossing supervision until

the change is constructed and it is not reasonable to install another form of traffic control or technique for this period.

#### 10-07.3 Criteria for Adult Crossing Guards

Adult Crossing Guards normally are assigned where official supervision of elementary school pedestrians is desirable while they cross a public highway on the "Suggested Route to School", and at least 40 elementary school pedestrians for each of any two hours (not necessarily consecutive) daily use the crossing while going to or from school. Adult crossing guards may be used under the following conditions:

- At uncontrolled crossings where there is no alternate controlled crossing within 180 m: and
  - a. In urban areas where the vehicular traffic volume exceeds 350 during each of any two hours (not necessarily consecutive) in which 40 or more school pedestrians cross daily while going to or from school; or
  - b. In rural areas where the vehicular traffic volume exceeds 300 during each of any two hours (not necessarily consecutive) in which 30 or more school pedestrians cross daily while going to or from school.

Whenever the critical (85th percentile) approach speed exceeds 40 mph (64 km/h), the guidelines for rural areas should be applied.

<sup>\*</sup> Available from the Automobile Club of Southern California and the California State Automobile Association (AAA).

#### 2. At stop sign-controlled crossing:

Where the vehicular traffic volumes on undivided highways of four or more lanes exceeds 500 per hour during any period when the school pedestrians are going to or from school.

#### 3. At traffic signal-controlled crossings:

- a. Where the number of vehicular turning movements through the school crosswalk exceeds 300 per hour while school pedestrians are going to or from school; or
- b. Where justified through analysis of the operations of the intersection.

## 10-07.4 Legal Authority and Program Funding for Adult Crossing Guards

Cities and counties may designate local law enforcement agencies, the governing board of any school district or a county superintendent of schools to recruit and assign adult crossing guards to intersections that meet approved guidelines for adult supervision.

There are various methods for funding a school adult crossing guard program. One of these methods is through the use of fines and forfeitures received under the Penal Code. Disposition of these fines and forfeitures is defined in Sections 42200 and 42201 of the California Vehicle Code. An example of these dispositions by cities and counties is as follows:

Disposition by cities (CVC 42200). Fines and forfeitures received by cities and deposited into a "Traffic Safety Fund" may be used to

pay the compensation of school crossing guards who are not regular full-time members of the police department of the city.

Disposition by county (CVC 42201). Fines and forfeitures received by a county and deposited in the road fund of the county may be used to pay the compensation of school crossing guards, and necessary equipment and administrative costs. The board of supervisors may adopt standards for crossing guards and has final authority over the total cost of the crossing guard program.

Another avenue of funding school adult crossing guard programs is through the use of the "Crossing Guard Maintenance District Act of 1974." This act defines how a local agency may form districts within which property and improvements may be assessed to pay the costs and expenses of providing school crossing guards. (Sections 55530-70 of the Government Code).

#### 10-07.5 Choice of Adult Crossing Guards

Adult crossing guards must understand children and have the ability to gain the respect of the children so that they respond to direction.

#### 10-07.6 Uniform of Adult Crossing Guards

Adult crossing guards should be uniformed so that motorists and pedestrians can recognize them and respond to their signals. It is recommended that their uniforms be distinctively different from those worn by regular police officers.

During periods of twilight or darkness, adult crossing guards should wear either reflectorized material or reflectorized clothing.

## 10-07.7 Training Programs for Adult Crossing Guards

Adequate training should be provided in adult crossing guard responsibilities and authority. This function can usually be performed effectively by a law enforcement agency responsible for traffic control.

Training programs should be designed to acquaint newly employed crossing guards with their specific duties, local traffic regulations, and crossing techniques. Training workshops may be used as a method of advising experienced employees of recent changes in existing traffic laws and program procedures. For example, crossing guards should be familiar with the California law which provides that any person who disregards any traffic signal or direction given by a non-student school crossing guard authorized by a law enforcement agency, any board of supervisors of a county or school district shall be guilty of an infraction and subject to the penalties of Section 42001 of the California Vehicle Code (CVC Section 2815).

## 10-07.8 Operating Procedures for Adult Crossing Guards

Adult crossing guards should not direct traffic, except that they may create gaps in the traffic stream at opportune times. The presence of a crossing guard in the roadway serves as an easily recognized indication to drivers that pedestrians are about to use the crosswalk and that all traffic must stop. When all traffic has stopped, the adult guard can allow the children to cross.

Adult crossing guards may use a "STOP" paddle (C28A), similar to the one show in Section 10-03.8. The paddle shall have "STOP" on both sides and it shall be retroreflective when used during hours of darkness.

#### 10-07.9 School Safety Patrols

School Safety Patrols aid school pedestrians at crossings near elementary schools. They are a supplemental technique rather than a traffic control device as defined in Section 440 of the California Vehicle Code.

School Safety Patrols may be used to direct and control children at crossings near schools where there is no need to create adequate gaps in traffic.

School Safety Patrols may be used to direct and control children at signalized intersections where turning movements are not a problem and to assist adult crossing guards in the control of children at crossing locations used by large numbers of children.

School Safety Patrols should not direct vehicular traffic.

#### 10-07.10 Criteria for School Safety Patrols

A School Safety Patrol may be established at locations where an existing traffic control device, police officer or adult crossing guard is in operation. They may also be used where there are adequate crossing gaps in vehicular flow at an uncontrolled crossing and it is desirable to use School Safety Patrols to guide the school pedestrians. School Safety Patrols should be established only by agreement between the governing board of the school district and local traffic law enforcement agencies.

A School Safety Patrol should be considered when all of the following conditions are fulfilled:

1. Twenty or more school pedestrians crossing in each of any two hours (not necessarily consecutive) daily enroute to or from school; and

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- 2. Critical (85th percentile) approach speed does not exceed 35 mph (56 km/h); and
- 3. No more than two traveled lanes in each direction; and
- 4. Have at least one "adequate crossing gap" in traffic per minute during an average 5-minute period during the peak school pedestrian hour.

An "adequate crossing gap" is defined as the number of seconds required for a student to observe the traffic situation while in a location at one side of a roadway and then to cross the roadway to a point on the opposite side. The actual walking time to cross (roadway width in meters divided by 1.1 m per second) must be added to the perception and reaction time (3 seconds minimum) and a clearance interval of 2 seconds between rows of pedestrians in the platoon/group.

Ga = 
$$3 \text{ sec.} + \frac{W}{1.1 \text{ m/sec.}} + 2 \text{ sec.} \text{ (N-1)}$$

Where: "Ga" is the adequate crossing gaps in seconds;
"W" is the roadway width in meters;
"N" is the number of rows of pedestrians in a platoon/group.

A School Safety Patrol shall not be assigned to locations where the stopping sight distance for the vehicular traffic is greater than the stopping site distance available.

#### 10-07.11 Legal Authority for School Safety Patrols

School Safety Patrols shall be authorized by the local school board. School authorities shall be responsible for organizing, instructing and supervising patrols with the assistance of the local police.

The California Education Code, Sections 49300 to 49307, and the California Code of Regulations, Sections 570 to 576 and 632, authorize the development of School Safety Patrols and outline rules for implementing these programs within the state.

#### 10-07.12 Choice of School Safety Patrols

School Safety Patrols shall be carefully selected. They shall be children from the 5th grade or higher and shall be at least 10 years of age. Leadership and reliability should be determining qualities for patrol membership.

Parental approval shall be obtained in writing before a child serves as a member of a school safety patrol.

## 10-07.13 Operating Procedures for School Safety Patrols

School Safety Patrols control children, not vehicles. They shall stop children back of the curb or edge of the roadway and allow them to cross only when there is an adequate gap in traffic (see California Code of Regulations Sections noted above in 10-07.11, for School Safety Patrols operating procedures and requirements).

#### 10-07.14 Uniform of School Safety Patrols

The use of the School Safety Patrol uniforms and insignia shall adhere to the following regulations (California Code of Regulations 576):

1. A School Safety Patrol member (except a member of the ROTC or California Cadet Corps on traffic duty in his official uniform) shall wear, at all times while on duty, the basic standard uniform specified in this section, except that the rainy day uniform may be worn under appropriate weather

- conditions. Only the optional additions described in this section may be added to the uniform.
- 2. The basic standard uniform for patrol members is the white or fluorescent orange Sam Browne belt and either an overseas type federal yellow or fluorescent orange cap or yellow or fluorescent orange helmet.

Optional additions to the basic standard uniform are any or all of the following:

- a. Colored piping on the federal yellow cap.
- b. Colored striping on the yellow helmet.
- c. A red or fluorescent orange upper garment.

- d. Insignia or a special badge identifying the organization to be worn over the left breast, left arm, or cap.
- Either retroreflective material or clothing for period of twilight or darkness.
- 3. The rainy day uniform is a federal yellow raincoat and a federal yellow rain hat. The Sam Browne belt may be worn over the raincoat.
- 4. The insignia or special badge and cap shall be worn only during official School Safety Patrol duty, except that the governing board may authorize members of the School Safety Patrol to wear the uniform and insignia for special school safety patrol functions.

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#### **Grade Separation Crossings 10-08**

#### 10-08.1 Function of Grade Separation Crossings

Grade separation crossings may be used to physically separate the crossing of school pedestrian traffic and vehicular flow. They may eliminate vehicular-pedestrian conflicts but are necessarily limited to selected locations where the benefits clearly balance the public investment. Separation crossings are supplemental techniques for reducing school pedestrian accidents and are not traffic control devices.

#### 10-08.2 Types of Grade Separation Crossings

Grade separation crossings may be either overcrossings or undercrossings. Overcrossings are easier to maintain and supervise than undercrossings.

# 10-08.3 Criteria for Use of Grade Separation Crossings

Grade separation crossings should be considered when the physical characteristics of the location make such a structure feasible. If use of the grade separation will be less convenient than an at-grade crossing, barriers or supervision will be needed to assure a satisfactory level of use.

Grade separation crossings should be considered when ALL of the following conditions are fulfilled:

- 1. The prevailing conditions that require a school pedestrian crossing must be of sufficient duration to justify the separation crossing structure; and
- 2. The location shall be on the "Suggested Route to School" at an uncontrolled intersection or mid-block location along an expressway or major arterial street where the traffic conditions make it very difficult for pedestrians to cross; and
- 3. Revision of the "Suggested Route to School" or the attendance boundaries to eliminate the conflict is not reasonable; and
- 4. Physical conditions make a separation crossing structure reasonable from an engineering standpoint, including pedestrian channelization to ensure usage of the structure; and
- 5. Adjacent controlled school pedestrian crossings are more than 180 m from the proposed structure and would require total out-of-direction walking distance of at least 360 m; and
- 6. Bus transportation, traffic signals, adult crossing guards or other means of resolving the school pedestrian-vehicular conflicts are not reasonable.

#### Pedestrian Walkways 10-09

#### 10-09.1 Function of Pedestrian Walkways

School pedestrian issues are not limited to crossing locations and may occur where physical conditions require students to walk in or along rural or suburban roadways.

Where students walk on the roadway, a shoulder width of 1.8 m is desirable along both sides so that they may walk facing oncoming traffic. Where a pedestrian walkway is provided, and is at least 1.2 m wide and physically separated from the traveled way, it may be limited to one side of the roadway.

This measure is a supplemental technique, not a traffic control device.

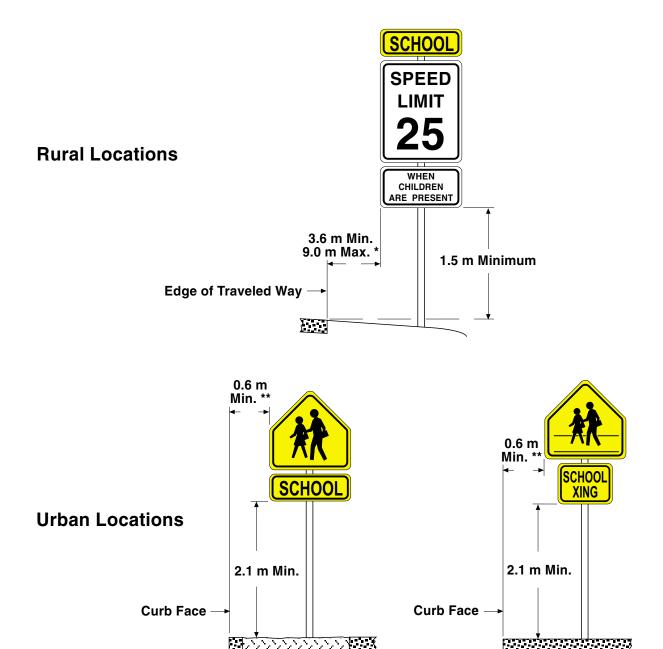
#### 10-09.2 Criteria for Use of Pedestrian Walkways

A Pedestrian Walkway should be considered when ALL of the following conditions are fulfilled:

- 1. The highway lies on the "Suggested Route to School"; and
- 2. Existing road shoulders outside the traveled way are less than 1.8 m wide; and
- 3. More than 20 school pedestrians use the route while walking to or from school and vehicular traffic exceeds 100 per hour during those periods of the day; and
- 4. The governing board of the school district officially requests the pedestrian walkway improvements; and
- 5. Revision of the "Suggested Route to School" or the attendance boundaries to eliminate the conflict is not reasonable.

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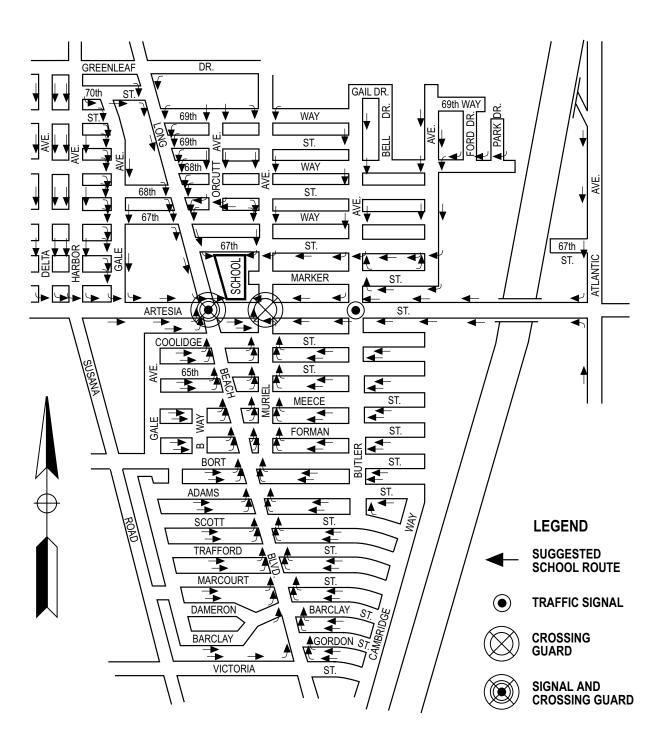
# Figure 10-1 Height And Lateral Position For Signs



#### NOTES:

- (\*) When clear roadside recovery areas are provided, signs shall be placed as far from the edge of traveled way as possible, up to a maximum of 9.0 m. When possible they shall be placed in locations less likely to be hit by a vehicle leaving the traveled way.
- (\*\*) In urban areas, where sidewalk width is limited or existing poles are close to the curb, a clearance of 0.3 m from the curb face is permissible.

# Figure 10-2 Typical School Route Plan



See Section 10-02.3 "School Responsibility" for information regarding the development of a suggested route to school plan.

**Greater Than** 

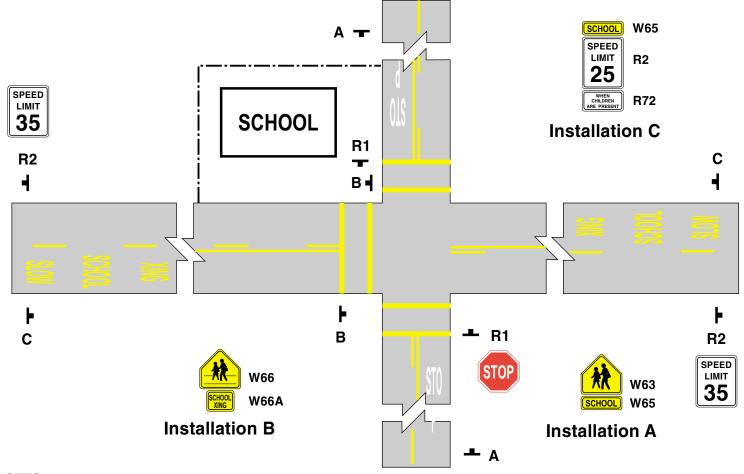
25 mph (40 km/h)

On The

Speed Limit
Through Street

School Located In

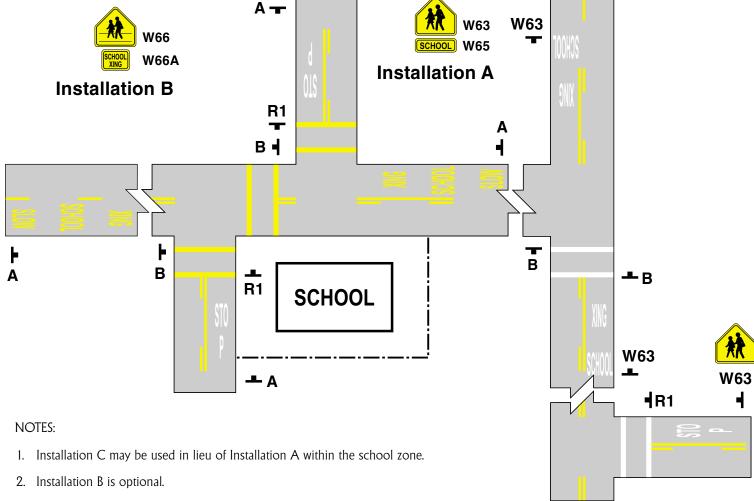
An Area



#### NOTES:

- 1. Installation C is to be located on highways contiguous to schools, not to exceed 150 m in advance of the school grounds.
- 2. Installation B is optional.
- 3. The "END SCHOOL ZONE" sign (W65-1) may be used in lieu of the R2(35) sign.
- 4. Yellow "SLOW SCHOOL XING" pavement marking shall be used in the lane(s) leading to all yellow crosswalks, except in advance of crosswalks at intersections controlled by "STOP" signs (R-1), traffic signals, or "YIELD" signs (R1-2) (CVC 21368). See Section 10-04.6.
- 5. See Section 10-03.8 for sign policies.

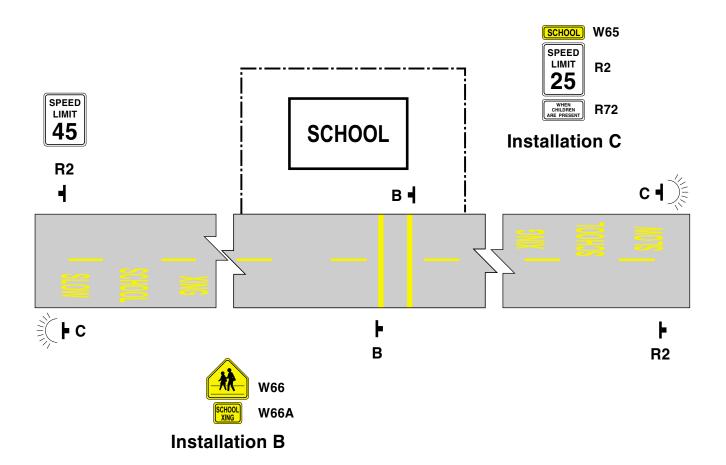
# School Located In 25 mph (40 km/h) Business Or Residential Area With Many School Crossings



- 3. The W63 signs with pavement markings at remote locations, are optional.
- 4. Remote crosswalks and pavement markings shall be white.
- 5. Yellow "SLOW SCHOOL XING" pavement marking shall be used in the lane(s) leading to all yellow crosswalks, except in advance of crosswalks at intersections controlled by "STOP" signs (R-1), traffic signals, or "YIELD" signs (R1-2) (CVC 21368). See Section 10-04.6.
  - See Section 10-03.8 for sign policies.

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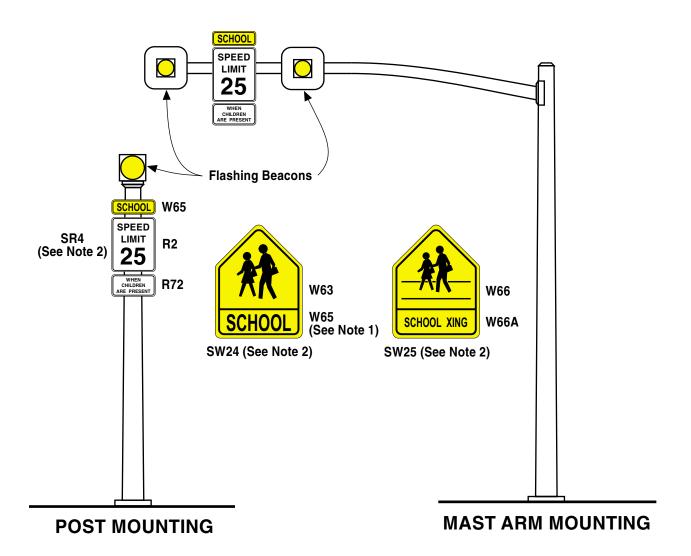
# Figure 10-5 School Adjacent To Highway At Mid-block Location Where Flashing Yellow Beacons Are Installed



#### NOTES:

- 1. Installation C is to be located on highways contiguous to schools, not to exceed 150 m in advance of the school grounds.
- 2. Installation B is optional.
- 3. The "END SCHOOL ZONE" sign (W65-1) may be used in lieu of the R2(45) sign.
- Yellow "SLOW SCHOOL XING" pavement marking shall be used in the lane(s) leading to all yellow crosswalks, except in advance of crosswalks at intersections controlled by "STOP" signs (R-1), traffic signals, or "YIELD" signs (R1-2) (CVC21368). See Section 10-04.6
- 5. See Section 10-03.8 for sign policies.

# Figure 10-6 Typical Installations For Flashing Yellow Beacons And Overhead School Signs



#### NOTES:

- 1. The W65 sign is omitted when the W63 sign is placed outside of the school zone.
- 2. Optional sign number when the sign is fabricated as a single unit. See Section 10-03.8.